

Undergraduate Admissions Tutor: Dr Lee Thompson

Department of Physics and Astronomy
The University of Sheffield

Hicks Building, Sheffield S3 7RH
Telephone: 0114 222 4362
Email: Physics.UCAS@Sheffield.ac.uk
www.shef.ac.uk/physics

UCAS Code SHEFD S18

May 2013



The
University
Of
Sheffield.

Physics

Theoretical Physics

Physics with Astrophysics

Physics with a year abroad

Physics with Medical Physics

Chemical Physics

Physics and Philosophy



Physics and Astronomy

Welcome

How likely are advanced civilisations in distant galaxies?
What is the origin of mass? Is it the Higgs boson?
Is our universe accelerating?
How will we generate enough energy for everyone in 2100?
Can we reverse global warming through carbon capture?
Is time travel possible?
Are there habitable planets in other star systems?
How big is the biggest star in the universe?
Can we make a solid state quantum computer?

If you chose to come to Sheffield to study physics you will join a community of 35 academic staff, 100 researchers and 300 undergraduate students researching answers to these questions. Different degree choices and optional modules allow you to tailor your learning to specialist interests and careers.

Each year around 30% of our students graduate to undertake research degrees. Most others find high quality employment in a vast range of different industries. Education - engineering - finance and research and development are the most popular.

Oclaro - Research and development engineer - Sellafield - Graduate trainee - Project manager - Actavis - Production process operator - Addenbrookers Hospital - Trainee clinical scientist - Aero Engineer Contracts - Graduate mechanical engineer - Allocate Software - Admin assistant - American Museum of Natural History - Research scientist (astronomy) - Appco - Charity fundraiser - Atomic Weapons Establishment - BAE Systems - Research fellow - BAE Systems - Graduate engineer - BG Group - Graduate trainee - Gas marketing and trading - Ineos Solutions - Sales representative - BP - Petrophysicist - BSUH University Hospitals Trust - Trainee medical physicist - Castle Hill Hospital - Trainee physicist (Physics) - CERN - Research fellow - Christian Church - Homeless support volunteer - Cobham - Graduate scheme trainee - Coca Cola Enterprise - Sales representative - Energy Services - IT consultant - Dorset Software - Computer programmer/analyst - eDigital - Graduate trainee - Ernst & Young - Tax assistant - Forum - Supervisor - Griffith University - Research fellow - Hargreaves Lansdown - Client support analyst - IBM - Sales representative - HJ Edwards - Sales assistant - Home Office - Scientific officer - Interac - TEFL - Lecturer - King Abdulaziz University - Lecturer - King Edward VI College - Physics technician - King's College Hospital - L B & J Mather - Office administrator - Leeds Hospital - Trainee clinical scientist - Leeds University - Leeds University - Research fellow (biological science) - Lincoln County Hospital - Trainee clinical scientist - Lingfield Notre Dame - Teaching assistant - Lund University - Postdoctoral worker - McMillan Cancer Support - Fundraiser - Mentholmans - Bar manager - Ministry of Education - English language assistant - Museum of Science and Industry - Science communication officer - National Audit Office - Assistant auditor - TEFL - Junior web developer - Paul-Drude-Institut Berlin - Intern - Phoenix Partnership - Software engineer - Phones4U - Sales consultant - Queen's University - Redwood Technologies - Engineering services engineer - Rutherford Institute of Technology - Postgraduate researcher - Private secondary education tutor - Self-employed - Sound engineer - Seychell Engineering - Machinist - Sheffield University - Post-doctorate research associate (physics) - Sheffield University - PhD researcher - Research student - Signature Gifts - Print worker - Smart Fix It - IT support technician - Steve Carter Designs - Carpenter's assistant - Swiss Federal Institute of Technology - Post doctoral researcher (Physics) - TATA Steel Group - Metallurgical technician - Tesco - IT Graduate - Testled - Front-end web developer - Texas University - Postdoctoral (Physics) - Thales - Graduate acoustics engineer - Toshiba Europe - Research scientist

Focus on...

ASTROPHYSICS

Academics Dr Stuart Littlefair and Prof. Vik Dhillon are searching for planets that might be habitable. They wait for planets to pass in front of distant stars and look for dips in the stars intensity due to absorption by the planet. They are searching for a unique combination of ozone and carbon dioxide - a signature that life could be present. The team have spent many years developing instruments sensitive enough to look for life in this way. Last year Sheffield undergraduate Liam Hardy travelled to Tenerife for his final year project to test the method. Liam observed a distant exoplanet pass in front of star...

We are one of very few departments in the UK to offer a dual honours course where 50% of the modules are specific to Astrophysics. X of our academic staff are active researchers in astrophysics and we offer around y modules covering topics from cosmology to the astro-biology.

The department owns three telescopes. Two are on the roof of the department. The one pictured is a cccc... that students use to observe in first and second year modules. We have a second roof mounted robotic telescope can be controlled remotely. The third telescope is in Tenerife. In years three and four students have a range of opportunities to travel to the Tenerife observatory, or as another option control the instrument remotely from Sheffield.

Research projects available to students in years 3 and 4 cover topics from ... to...

Every year we take z PhD students in astrophysics related research

ASTROPHYSICS courses

Code	Course	Entry
FF35	BSc Physics and Astrophysics	AAB
F3F5	MPhys Physics and Astrophysics	AAA
FF3M	MPhys Physics and Astrophysics with a year abroad	AAA

Focus on...

PARTICLE PHYSICS

The facilities we have

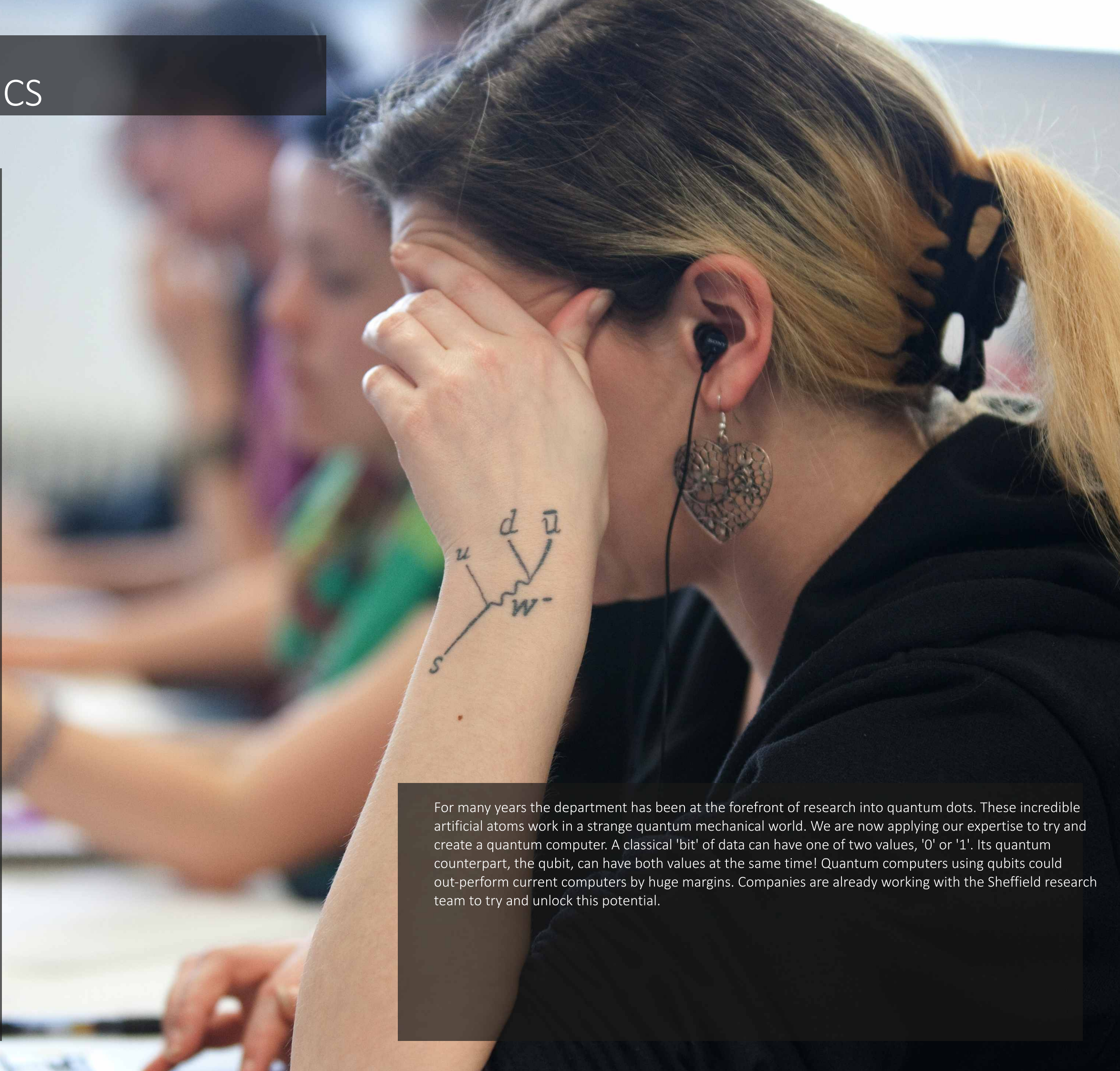
The modules we teach

Last year was an exciting time to be in the physics department in Sheffield. Several academic staff are directly involved in the Large Hadron Collider at CERN. Dr Stathes Paganis teaches atomic physics, electromagnetism and runs the second year lab. He directly helped analyse the data that discovered the Higgs boson. Prof. Dan Tovey teaches advanced quantum mechanics and is part of a team investigating evidence for supersymmetry. Dr Davide Costanzo

Dr Paganis explains, "The Higgs boson shows us how electromagnetic and weak nuclear interactions were the same just after the big bang, but are now very different. Undergraduate students are currently helping me to analyse the vast amount of data from the LHC. The question now is whether the Higgs is fundamental, or whether it is built from other, new particles with new interactions. Maybe there are other forces to be found?"

Focus on...

QUANTUM MECHANICS

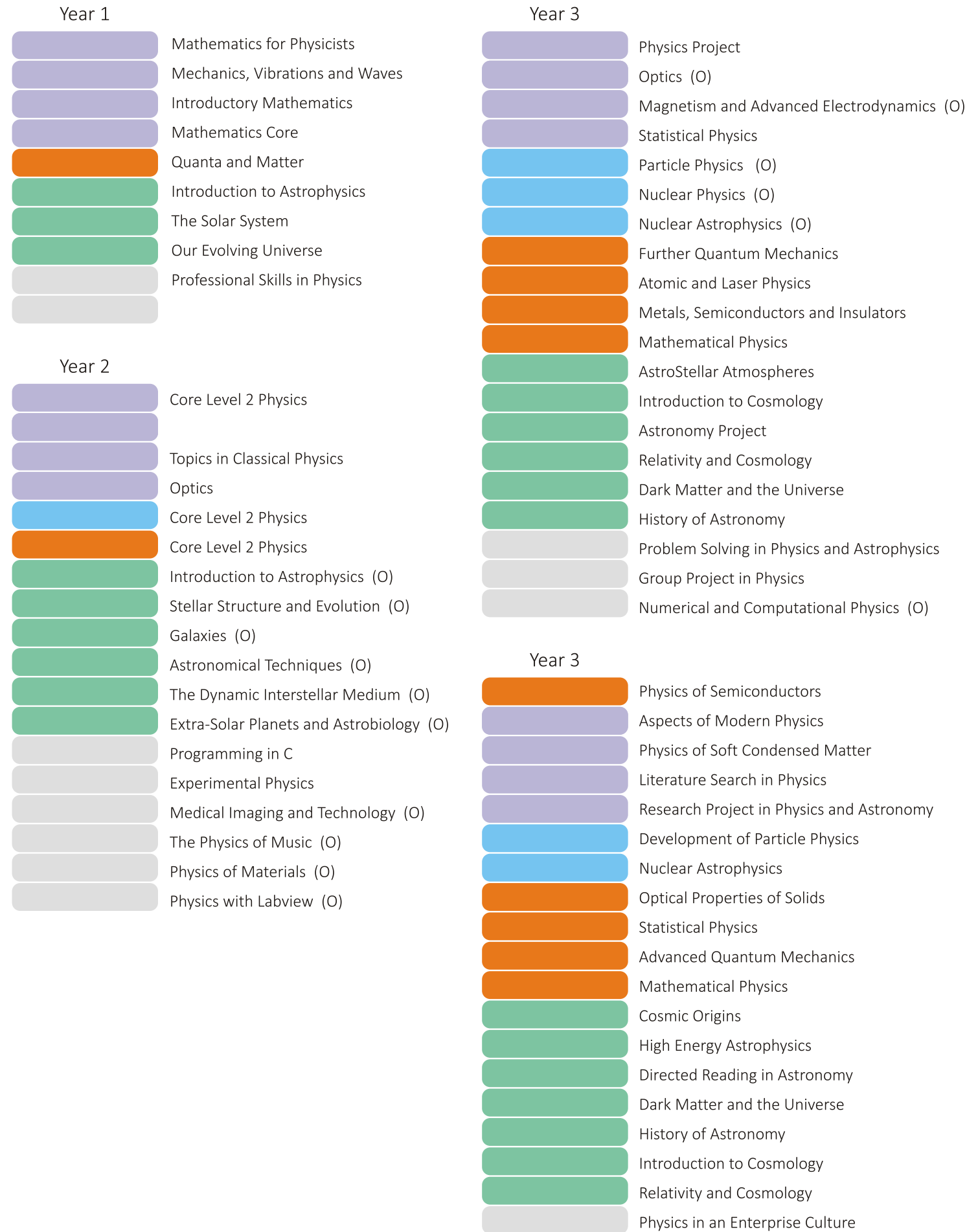


For many years the department has been at the forefront of research into quantum dots. These incredible artificial atoms work in a strange quantum mechanical world. We are now applying our expertise to try and create a quantum computer. A classical 'bit' of data can have one of two values, '0' or '1'. Its quantum counterpart, the qubit, can have both values at the same time! Quantum computers using qubits could out-perform current computers by huge margins. Companies are already working with the Sheffield research team to try and unlock this potential.

PHYSICS courses

Physics course details

F300	BSc Physics	AAB
F301	MPhys Physics	AAA
F305	MPhys Physics with study in North America	AAA
F304	MPhys Physics with study in Australia	AAA
F334	BSc Theoretical Physics	AAB
F321	MPhys Theoretical Physics	AAA
F350	BSc Physics with Medical Physics	AAB
F371	MPhys Physics with Medical Physics	AAA
F335	MPhys Chemical Physics	AAB
FV35	Bsc Physics with Philosophy	AAB



Focus on...

PHYSICS for INDUSTRY

Research news...

Particle physicists have a range of methods to detect different sub atomic particles. Neutrons are one of the more difficult - they require special material to create charged particles from a neutron collision. He3 is typically used - but there is only so much He3 available and it is very expensive. Finding a cheaper method was a challenge that Sheffield research fellow Dr John McMillan embraced. John found that cosmetics material boron nitride was both pure enough - and contained enough Boron10 isotope to convert neutrons to alpha particles. The home office are currently funding John to further develop the detection method for screening cargo at ports. Identifying different radioactive materials is also a popular second year laboratory experiment that John has set up to help teach this important aspect of physics.

Dr Lee Thomson is the departments admission tutor - but he also recently been awarded a research grant by the Department for Energy and Climate Change to develop ways of detecting the storage of CO2 underground - using cosmic rays. Different types of rock have absorb cosmic muons with different strength and by placing detectors underground and measuring the cosmic muon flux at different angles the storage of CO2 can be monitored.

The energy theme runs through much of our materials science research and teaching. We deliver a module on the physics of sustainable energy. In conjunction with the CO2 storage research last year undergraduates investigated cosmic ray detectors using plastic scintillators. Around 20 undergraduate and postgraduate students are developing low cost solar cells from special combinations of molecular compounds and nanomaterials. Several of these new materials are synthesised in the chemistry department. We also have access to high quality industrial fabrication facilities housed within the Universities nanoscience research centre.

The department is also host to the UK's largest domestic solar energy micro-generation database - where UK residents collaborate with us by donating electricity generation data to understand how often solar cells fail and how efficient they are.

Every year several of our students enroll to become teachers and we provide support through the provision of dedicated year 3 projects. Last year around 8 undergraduate students undertook research projects to investigate science teaching methods in local secondary schools. They all travelled to the schools and delivered specially prepared lessons to groups of children.

We have several specialist degrees for industry and teach modules in team working - computer programming - instrumentation - and enterprise.



SPECIALIST PHYSICS courses

TEACHING



Lectures

Much of our key material is taught in lecture classes. Our students really enjoy the experience of being taught in a big class. Our lecturers are very experienced in this style of teaching and make an effort to keep their audience alert and entertained. Blackboard based “talk and chalk” is still one of the best ways to teach physics, and the positive feedback we receive from this style of teaching tells us not to change too much.

Tutorials

Tutorials have been a mainstay of university teaching for many years, and like lectures, they are not changing here in Sheffield. Groups of 5-10 students meet with a lecturer for 1 hour to go over materials and practice solving problems together. These sessions are a good way to ask specific questions and to learn how to approach problems

Labs

Experimental work links in to the material learned in lectures. In the 1st and second year a whole module each semester is devoted to laboratory training. Here you will investigate different aspects of physics as well as learning how to present results, analyse data, and assess and manipulate errors.

Programming classes

Computer programming lies at the heart of much academic and industrial research. We teach in a variety of different languages that include Matlab, C++, C, Labview as well as training you to use Excel to analyse data.

Problem classes

Problem solving is probably the most important employment skill that a physics student graduates with. It is a combination of numerical reasoning and physical understanding that leads to an ability to solve both academic physics problems, industrial engineering problems and much more.

Research projects

In years three and four all students undertake a research project. This could be work associated with some of the departments cutting edge research, or it could be learning about different methods of science teaching. There are many different projects on offer from all the academic staff in the department.

Applying to sheffield

The University of Sheffield is one of the best in the country. It combines high quality teaching and research across a wide range of subjects. In 2011 it was voted the very best university in the UK. The University Union is widely recognised as being among the best in the UK. It houses two bars, a night club and a 400 seat cinema.

There are around 150 different clubs and societies; the physics society being among the most active. The University owns a designated sports centre with a swimming pool, gym, synthetic football and hockey pitches and even an indoor climbing wall. The sports centre, accommodation and teaching and research facilities all lie within one mile. The accommodation is situated towards the western edge of the city and while the walk is only 15 minutes there are also frequent buses.

Most first year students live together in one of two accommodation villages. Both Ranmoor and Endcliffe student villages have both been recently built and offer some of the highest quality accommodation in the UK. The villages lie 1 mile to the west of the students union and university.

Pictured is the central bar, catering and social space in the Endcliffe village. The green open spaces are a theme in this part of the city and students are very lucky to live here.

After year one most students find accommodation within a mile of the university - living in rented houses with friends. Crookes - Hunters Bar - Broomhill - Walkley are all popular areas. There is also an increasing number of students choosing to live in newly built accommodation close to the revitalised city centre.

Our recruitment cycle

Summer open days

You can visit the University and the Physics department
For details of this years dates visit www.sheffield.ac.uk/opendays

Application to UCAS

1st September to 15th January
Talk to your school or visit www.ucas.com for details
Our UCAS reference code is S18 SHEFD

Autumn and Winter UCAS days

Once we receive your application we will invite you to a UCAS day
We will make you an offer of a place during the day
If you do not chose to visit we may also offer you a place
The offer will be conditional on certain achievements or grades

Accepting our offer

We hope you will accept our offer
You let us know via UCAS

Late applications may be accepted - call us to check

Meeting our offer

You must achieve the requirements by 31st August in the year of application

Insurance

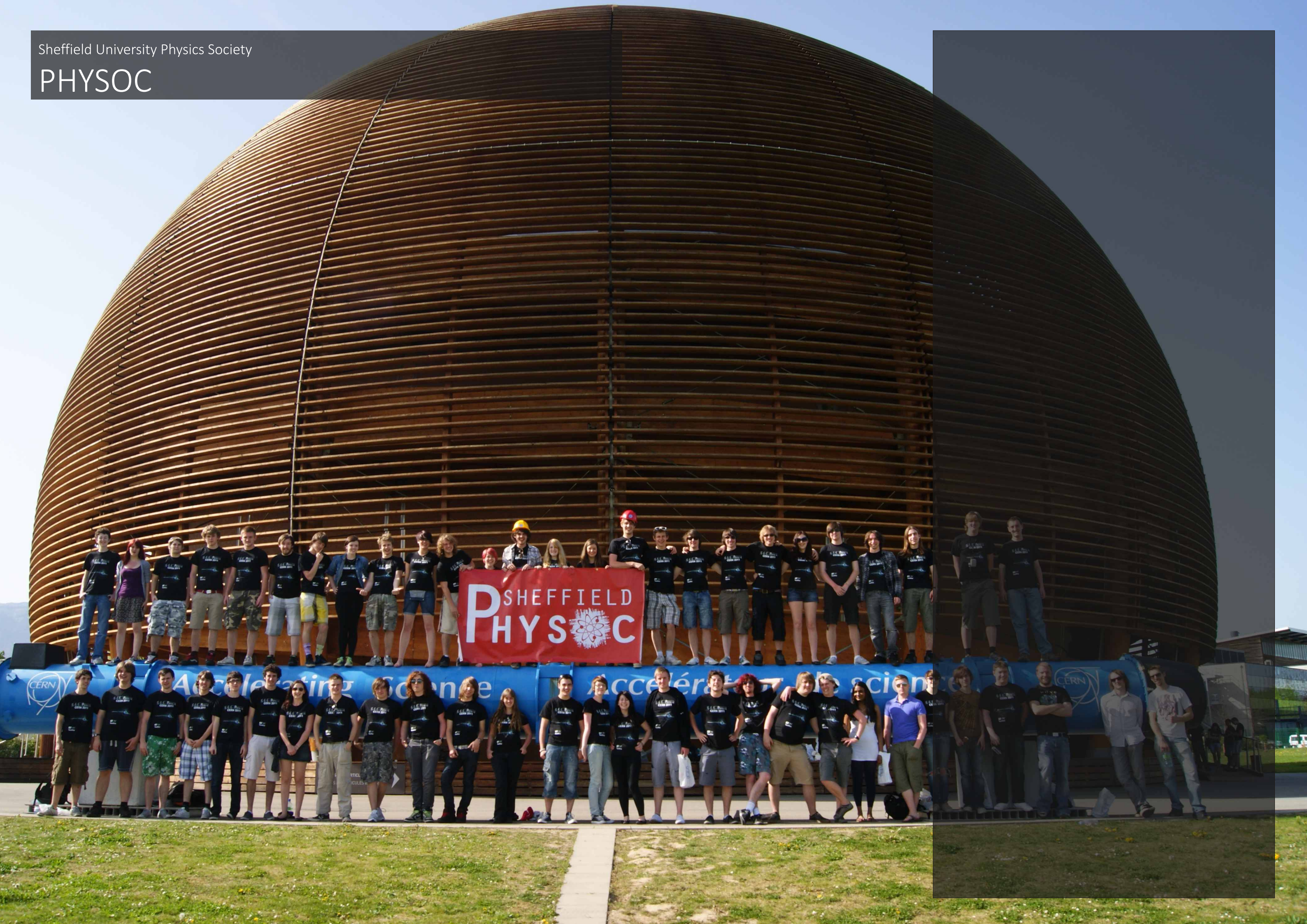
If you have an offer for an MPhys course and miss by one grade we will accept you on a BSc equivalent course. You are able to upgrade to the MPhys is you achieve good marks.

Fees and bursaries

Please check www.sheffield.ac.uk/fees2012 for up to date information

Sheffield University Physics Society

PHYSOC



The City of Sheffield



Sheffield city is the UK's 5th largest. It has one of the lowest living costs of any University city and is also the greenest city in the country. It borders the peak district and many students make good use of this for climbing, walking cycling and running. The city itself has international venues for entertainment and sport.